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In The Supreme Court of the United States

COMMONWEALTH OF MASSACHUSETTS, *et al.*,

Petitioners,

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY,

Respondent.

On Writ Of Certiorari To The United States Court Of Appeals For The District Of Columbia Circuit

BRIEF OF FORMER EPA ADMINISTRATORS CAROL M. BROWNER, WILLIAM K. REILLY, DOUGLAS M. COSTLE AND RUSSELL E. TRAIN AS *AMICI CURIAE* IN SUPPORT OF PETITIONERS

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INTERESTS OF *AMICI CURIAE*

Amici[1] are four former Administrators of the United States Environmental Protection Agency ("Agency" or "EPA") whose service collectively spanned roughly 20 years of the Agency's 36-year history. Each *Amici* has faced decisions whether to regulate particular air pollutants and pollution sources under the Clean Air Act and each has an interest in ensuring that such decisions are based on careful consideration of the best available scientific evidence, do not stray from the statutorily required factors, and are protective of the public health and welfare. *Amici* also have an interest in ensuring that EPA continues to use its broad authority under the Clean Air Act to address new pollution problems as they emerge, even if some scientific uncertainties remain. Most immediately, *Amici* have grave concerns about the consequences of global climate change – the most significant public health and environmental threat facing EPA, the nation, and the world.

SUMMARY OF THE ARGUMENT

The Clean Air Act, like many other environmental statutes, requires EPA to regulate certain pollutants and pollution sources identified by Congress, as well as additional pollutants and sources not specified in the statute.

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[1] *Amici* are former EPA Administrators Carol M. Browner (January 1993 to January 2001), William K. Reilly (February 1989 to January 1993), Douglas M. Costle (March 1977 to January 1981), and Russell E. Train (September 1973 to January 1977). All parties have consented to the filing of this brief in letters that are on file with the Clerk. Pursuant to S. Ct. R. 37.6, counsel for *Amici* state that no counsel for a party authored this brief in whole or in part and no person or entity, other than *Amici* or their counsel, made a monetary contribution to the preparation or submission of this brief.

Recognizing the need for an expert agency to identify, investigate and, where appropriate, regulate air pollution based on new and changing scientific information, Congress directed EPA to assess (and reassess when necessary) the evolving state of such information. Based on the best available science, the Clean Air Act requires EPA to identify, and thereafter regulate, those substances that it determines are reasonably anticipated to endanger public health or welfare.

Scientific knowledge is not static; it changes over time in response to new data and analysis. In order to fulfill its statutory obligations under the Clean Air Act, EPA historically has found it necessary and appropriate to utilize new or emerging scientific information in its decisionmaking process, even in the face of some continued scientific debate and uncertainty. Indeed, postponing action until there is unanimous scientific consensus effectively would preclude EPA from ever acting to protect the public health because there can never be absolute scientific certainty.

Each of *Amici* has observed first-hand rapid changes in scientific knowledge concerning the dangers posed by particular pollutants. For instance, emerging scientific data warranted immediate regulation of neurotoxic lead additives in gasoline, carcinogenic emissions of airborne benzene, ozone-depleting chlorofluorocarbons, and lung function-altering fine particulate matter. In discharging their obligation to protect the public health and welfare in the face of these threats, *Amici* found essential their Clean Air Act authority to take regulatory actions not specifically mandated or contemplated by Congress based on developing scientific information, even in the face of some remaining scientific debate.

EPA's decision not to regulate greenhouse gases based on non-science related policy considerations and residual

scientific uncertainty undermines the bedrock principles that have guided the Agency's implementation of the Clean Air Act for more than three decades. Congress has already made the policy decision to regulate dangerous pollutants and has charged EPA with the role of applying its considerable technical expertise to the scientific question of whether a particular pollutant may endanger public health or welfare. The Agency is not empowered to subordinate science-based regulatory decisionmaking to non-statutory policy considerations and thereby avoid entirely the necessary regulatory decision. Such considerations come into play, when authorized by the law, only in the Agency's choice of implementation tools to address the underlying environmental threat.

ARGUMENT

I. THE CLEAN AIR ACT REQUIRES TIMELY REGULATION OF AIR POLLUTANTS NOT SPECIFICALLY ENUMERATED IN THE STATUTE BASED ON THE BEST AVAILABLE SCIENCE.

The Clean Air Act Amendments of 1970 addressed the serious, growing, and then-unchecked problem of air pollution.[2] The primary purpose of the Act is prophylactic: "to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare

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[2] *See Union Elec. Co. v. EPA*, 427 U.S. 246, 256 (1976) ("[T]he 1970 Amendments to the Clean Air Act were a drastic remedy to what was perceived as a serious and otherwise uncheckable problem of air pollution."); *Train v. Natural Resources Defense Council*, 421 U.S. 60, 64 (1975) (disappointed with the failure of states to control air pollution and improve air quality, "Congress reacted by taking a stick to the States in the form of the Clean Air Amendments of 1970.").

and the productive capacity of its population." 42 U.S.C. § 7401(b)(1).[3] Because Congress recognized that little was known about air pollution when the Act was passed, it directed EPA to evaluate the available scientific evidence, and collect additional data where necessary, to determine which pollutants and pollution sources are likely to endanger public health or welfare. Based on these "endangerment" findings, EPA is then obligated to act preventively to minimize the risk of harm to humans and the environment.[4] Congress also recognized that early regulation served another salutary purpose, acting as a catalyst for the development of new pollution-reducing technologies.[5]

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[3] *See also American Lung Ass'n v. EPA*, 134 F.3d 388, 389 (D.C. Cir. 1998) (Clean Air Act was "[d]riven by [Congress'] deep concern for protection of the health of the American people"); *Lead Industries Ass'n, Inc. v. EPA*, 647 F.2d 1130, 1148 (D.C. Cir.), *cert. den.*, 449 U.S. 1042 (1980) (Clean Air Act embodies a "deliberate decision by Congress to subordinate [economic and technical feasibility] concerns to the achievement of health goals"); S. Rep. No. 91-1196, at 2-3 (1970) ("The Committee determined that . . . the health of people is more important than the question of whether the early achievement of ambient air quality standards protective of health is technically feasible.").

[4] *See, e.g., American Lung Ass'n v. EPA*, 134 F.3d at 389; *Lead Industries Ass'n, Inc. v. EPA*, 647 F.2d at 1155; *Ethyl Corp. v. EPA*, 541 F.2d 1, 13, 15, 17 (D.C. Cir.), *cert. den.*, 426 U.S. 941 (1976); H.R. Rep. No. 95-294, at 49 (1977) (statement in House Report accompanying 1977 amendments to the Clean Air Act that one of the legislation's purposes is "(t)o emphasize the preventive or precautionary nature of the act, i.e., to assure that regulatory action can effectively prevent harm before it occurs; to emphasize the predominant value of protection of public health").

[5] *See Union Elec. Co. v. EPA*, 427 U.S. at 269 ("Technology forcing is a concept somewhat new to our national experience and it necessarily entails certain risks. But Congress considered those risks in passing the 1970 Amendments and decided that the dangers posed by uncontrolled air pollution made them worth taking."); *American Petroleum Inst. v. Costle*, 665 F.2d 1176, 1185 (D.C. Cir. 1981), *cert. den.*, 455 U.S. 1034 (1982) (reiterating that "the 'technology-forcing' requirements of the Act were expressly designed to force regulated sources to develop pollution

(Continued on following page)

To achieve its objectives, the Clean Air Act provides EPA with the necessary tools to address new pollution problems as they arise or become recognized. Rather than attempting to specify each particular pollutant or pollution source that EPA must regulate, which would require frequent statutory amendments to permit regulation of new threats, Congress broadly defined the term "air pollutant"[6] under the Act and directed the Agency to use scientific evidence to identify those pollutants and emission sources that may "endanger public health or welfare." *See, e.g.*, 42 U.S.C. §§ 7521(a)(1) (motor vehicle emissions), 7545(c) (fuel additives), 7547(a) (nonroad vehicles), 7408(a)(1) (criteria air pollutants).[7]

The statute's emphasis on science-based determinations has reaped enormous benefits, such as reduced incidence of adverse human health effects, improved visibility, and reduced damages to agricultural crops. In a far-reaching, peer-reviewed 1997 study of the Clean Air Act's costs and benefits, EPA concluded that implementation of the statute had produced direct benefits of between $5.6 and $49.4 trillion, in 1990 dollars, with a mean estimate of $22.2 trillion, while the direct costs to the

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control devices that might at the time appear to be economically or technologically infeasible"); *Ethyl Corp. v. EPA*, 541 F.2d at 14 (noting the "technology forcing" nature of the statute and Congress' reliance on "health-based standards" to achieve the requisite control).

[6] Air pollutant is defined as "any air pollution agent or combination of such agents, including any physical, chemical, biological, radioactive (including source material, special nuclear material, and byproduct material) substance or matter which is emitted into or otherwise enters ambient air." 42 U.S.C. § 7602(g).

[7] In those cases where Congress specified the regulation of particular pollutants, it nonetheless gave EPA authority to regulate additional pollutants that endanger human health or the environment. *See, e.g.*, 42 U.S.C. § 7412(b)(2).

public and private sectors of implementing the statute were estimated at $523 billion. Thus, for the period from 1970 to 1990, the benefits of the Clean Air Act exceeded its costs by more than 42 times. Without the Clean Air Act, 60 metropolitan areas in the U.S. would have had worse air quality in 1990 – in terms of total suspended particulates – than Moscow, Russia.[8]

Section 202(a)(1), the provision at issue in this case, plainly embodies the science-based, preventive approach that has played such a critical role in the Clean Air Act's success. It directs that the Administrator "shall by regulation prescribe . . . standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicles engines, *which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare.*" 42 U.S.C. § 7521(a)(1) (emphasis added). Thus, the only criterion in taking the initial step toward regulation is scientific: is the pollutant reasonably anticipated to endanger public health or welfare? This statutory formulation reflects congressional appreciation of EPA's expert role in the evaluation and interpretation of scientific evidence. Once a health-based endangerment determination is made, the Administrator then is directed to prescribe implementing regulations as

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[8] *See* EPA, *The Benefits and Costs of the Clean Air Act: 1970 to 1990*, at 55-58 (Oct. 15, 1997), available at http://www.epa.gov/oar/sect812 (visited Aug. 29, 2006). In fact, actual benefits are likely to be even greater. For instance, the study's monetized calculations did not include the subjective value that individuals may place on the many benefits of the Clean Air Act's regulatory programs, such as 184,000 lives not cut short by exposure to particulate matter or ten million IQ points not lost due to lead poisoning between 1970 and 1990. *See id.* at 37-38, 43-50; Frank Ackerman and Lisa Heinzerling, *Priceless: On Knowing the Price of Everything and the Value of Nothing* 102-104 (2004).

"necessary to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance." *Id.* § 7521(a)(2).

II. *AMICI* HAVE EACH USED THEIR AUTHORITY UNDER THE CLEAN AIR ACT TO PROTECT THE PUBLIC FROM NEW POLLUTANTS AND EMERGING HEALTH THREATS.

During their 20 years of service as EPA Administrators, *Amici* observed three essential guiding principles in administering the Clean Air Act:

(1) The Act confers broad authority on EPA to regulate pollutants and pollutant sources not specifically enumerated in the statute;

(2) EPA's decision whether to regulate specific pollutants and pollutant sources must be based on the best available scientific evidence concerning the likely impact on human health and welfare; and

(3) Given the unacceptably high health and environmental costs of waiting for perfect information, absolute scientific certainty concerning all aspects of a pollutant's impacts is not a necessary prerequisite to regulation.

The four major Clean Air Act regulatory decisions described below exemplify how adherence to these fundamental principles has meaningfully informed EPA's judgment over the last 30 years.

A. The Regulatory Phase-Out Of Lead Additives In Gasoline.

One of the most remarkable regulatory success stories began during the Clean Air Act's earliest days under Administrator Russell Train, when EPA took on the

serious public health threat posed by lead emissions from motor vehicles. In the face of some scientific uncertainty and over the strong objections of industry, the Administrator nevertheless acted under his new statutory authority to protect the health of urban populations, particularly vulnerable young children, from the potentially devastating effects of airborne lead. In doing so, he set a course for future regulatory decisionmaking under the Clean Air Act that was later ratified by Congress and has since proven critical to fulfilling the statute's public health mission.

Human exposure to elemental lead, which performs no useful function in the body, can have life-altering consequences. Absorbed through either inhalation or ingestion, lead's damage is cumulative. Chronic exposure to low levels can adversely affect blood pressure, kidney function, and the central nervous system, particularly in children, who can suffer impaired cognitive development and functioning, reduced growth, altered behavior and fine motor function, and permanent neurological damage. At higher levels of exposure, lead can cause low sperm count, spontaneous abortions, low fetal birth weight, and slowed post-natal neurobehavioral development, as well as kidney damage, brain damage, and even death by lead poisoning.[9]

Ambient lead levels increased rapidly in the wake of industrialization. The early twentieth century witnessed the most dramatic rise, in large part as a result of General Motor's discovery in 1921 that tetraethyl lead could enhance

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[9] *See generally* EPA, *Technology Transfer Network Air Toxics Website, Lead Compounds*, available at http://www.epa.gov/ttn/atw/hlthef/lead.html (visited on Aug. 29, 2006); Agency for Toxic Substances and Disease Registry, *Toxicological Profile for Lead, Draft for Public Comment* (Sept. 2005) (hereinafter "*ATSDR Lead Profile*"), available at http://www.atsdr.cdc.gov/toxprofiles/tp13.html (visited Aug. 29, 2006).

gasoline combustion and avoid engine "knock." General Motors soon joined forces with Standard Oil of New Jersey to form the Ethyl Corporation for the purpose of marketing this new lead additive for gasoline, which quickly became the industry standard.[10] By the 1970's, the combustion of leaded gasoline was responsible for roughly 90 percent of anthropogenic lead emissions to the atmosphere. *Ethyl Corp. v. EPA*, 541 F.2d at 8; *ATSDR Lead Profile* at 277.

The question facing public health officials was whether this airborne lead was a significant contributing source of observed elevated human lead levels. For decades the automotive and lead additive industries denied the existence of any health effects from their products, claiming that human exposure resulted primarily from ingestion of leaded paint and from industrial facilities.[11] Although concern about the neurological effects of lead exposure on children continued to mount,[12] uncertainty about the source of such exposure remained. For instance, in 1966 Senate hearings on the issue, Ethyl Corporation representatives and university scientists presented conflicting testimony on the causal relationship between airborne lead and elevated lead levels in human populations. *See Air Pollution – 1966, Hearings on S.3112 and S.3400 Before a Subcomm. on Air and Water*

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[10] *See generally* David Rosner & Gerald Markowitz, *A 'Gift of God'?: The Public Health Controversy over Leaded Gasoline during the 1920s*, 75 Am. J. Pub. Health 344 (1985).

[11] *See* Robert V. Percival, *Who's Afraid of the Precautionary Principle?*, 23 Pace Envtl. L. Rev. 21 (Winter 2005-06) and sources cited therein for a more detailed explanation of the industry's arguments.

[12] *See* Gerald Markowitz & David Rosner, *"Cater to the Children": The Role of the Lead Industry in a Public Health Tragedy, 1900-1955*, 90 Am. J. Pub. Health 36, 44 (2000).

Pollution of the Comm. on Public Works, 89th Cong., 2nd Sess. (1966).

Passage of the Clean Air Act Amendments in 1970 provided the newly-formed EPA with the tools required to confront airborne lead, although the statute nowhere specifically addressed this pollutant. In addition to directing specific reductions in particular motor vehicle pollutants under section 202(b)(1)(A), Congress also authorized EPA to control or reduce any fuel additive whose emission products "will endanger the public health or welfare" under section 211(c)(1)(A). Pub. L. No. 91-604, § 9(a), 84 Stat. 1676, 1698 (1970). Shortly after adoption of the legislation, EPA began evaluating controls on leaded gasoline. *See* 36 Fed. Reg. 1486 (Jan. 30, 1971).[13] Over the next two years, the Agency twice proposed a schedule to reduce the maximum amount of lead allowed in gasoline pursuant to its "endangerment" authority in section 211(c)(1)(A), over the vigorous objections of industry. 37 Fed. Reg. 3882 (Feb. 7, 1972); 38 Fed. Reg. 1258 (Jan. 10, 1973).[14]

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[13] EPA was concerned about two distinct problems: (1) the incompatibility of lead with catalytic converter emission control systems that industry had developed to address other air pollution from motor vehicle engines and (2) the human health effects of ubiquitous lead exposure. *Ethyl Corp. v. EPA*, 541 F.2d at 9-10. The Agency ultimately addressed these disparate concerns in two different rulemakings.

[14] Concurrent with this proposal, EPA adopted final regulations mandating the availability of lead-free gasoline for cars with catalytic converters, pursuant to section 211(c)(1)(B), in order to address concerns about lead fouling of these emission systems. 38 Fed. Reg. 1254 (Jan. 10, 1973). In the subsequent adoption of separate regulations for lead additive content pursuant to its separate section 211(c)(1)(A) "endangerment" authority, the Agency recognized that "based on public health consideration, it was considered necessary to propose a reduction in the lead content of leaded gasoline as well." 38 Fed. Reg. 33,734 (Dec. 6, 1973).

Despite the continuing controversy and the incompletely settled science, Administrator Train acted swiftly after his appointment to adopt final health-based standards designed to reduce lead levels in gasoline by 60-65 percent over the next five years. 38 Fed. Reg. 33,734, 33,734-41 (Dec. 6, 1973). This regulation embodied two important principles that have continued to undergird EPA's Clean Air Act regulatory decisions over the subsequent decades. First, the Administrator used his broad statutory authority and public health mandate to regulate a pollutant that he believed posed substantial danger to the public, even without any specific statutory direction to do so. Second, the decision to regulate was based on the best available science – and only the science – notwithstanding lingering questions about the correlation between airborne lead and elevated lead levels in human populations. *See id.* at 33,735-37.

Of particular note is EPA's approach to the question of scientific uncertainty – and the courts' and Congress' subsequent embrace of that approach. In response to industry comments on the proposed rule, EPA acknowledged the existence of other, potentially significant sources of environmental lead (lead paint, smelters, etc.) and the less-than-definitive conclusions in the scientific literature on the role of airborne lead in human exposure. 38 Fed. Reg. at 33,735-37. Yet the Administrator did not await the final scientific resolution of these issues before acting. He believed he was empowered, required even, to implement the statute's overarching public health directive and endangerment standards by regulating lead.

No one challenged EPA's broad authority to regulate new pollutants under section 211(c)(1)(A), but industry argued strenuously that EPA had failed to show "consistently strong correlations" between air lead levels and blood lead levels, 38

Fed. Reg. at 33,734, and ultimately filed suit challenging the new rule. It argued that the "will endanger" language of section 211 required proof of actual harm rather than simply "a significant risk of harm." *See Ethyl Corp. v. EPA*, 541 F.2d at 12. The D.C. Circuit Court of Appeals rejected industry's contention, reasoning by analogy to the Eighth Circuit's interpretation of a similar provision under the Clean Water Act in *Reserve Mining Co. v. EPA*, 514 F.2d 492 (8th Cir. 1975), and holding that the very structure of the Clean Air Act "would seem to *demand* that regulatory action precede, and, optimally, prevent, the perceived threat." *Id.* at 13, 17 (emphasis in original). The court explained why the harm at issue need not be inevitable and why its full extent need not be understood in all the particulars:

> Questions involving the environment are particularly prone to uncertainty. Technological man has altered his world in ways never before experienced or anticipated. The health effects of such alterations are often unknown, sometimes unknowable. While a concerned Congress has passed legislation providing for protection of the public health against gross environmental modifications, the regulators entrusted with the enforcement of such laws have not thereby been endowed with a prescience that removes all doubt from their decisionmaking. . . . Sometimes, of course, relatively certain proof of danger or harm from such modifications can be readily found. But, more commonly, "reasonable medical concerns" and theory long precede certainty. Yet the statutes and common sense demand regulatory action to prevent harm, even if the regulator is less than certain that harm is otherwise inevitable.

Ethyl Corp. v. EPA, 541 F.2d at 24-25 (internal citations omitted). This conclusion, the *en banc* majority noted,[15] "follows not only from the language of Section 211(c)(1)(A) and its legislative history, but from the nature of the Administrator's charge: to protect the public from danger." *Id.* at 24.[16]

The *Ethyl Corp.* decision is significant for another reason. In it, the court held that the Clean Air Act does not allow EPA to make (or fail to make) endangerment determinations based on policy considerations unrelated to public health and welfare: "Congress [has not] left the Administrator free to set policy on his own terms. To the contrary, the policy guidelines are largely set, both in the statutory term 'will endanger' and in the relationship of that term to other section of the Clean Air Act." *Id.* at 29.

In amending the Clean Air Act in 1977, Congress explicitly endorsed *Ethyl Corp's* reasoning. Prior to 1977, sections 202(a)(1) and 211(c)(1) required EPA to regulate pollution that "will endanger" public health or welfare. In 1977, Congress amended these provisions to require EPA to regulate pollutants that "*may reasonably be anticipated to endanger* public health or welfare." 42 U.S.C. §§ 7521(a)(1) and 7545(c)(1) (emphasis added) (amended by Pub. L. No. 95-95 § 401, 91 Stat. 685, 791 (1977)). The drafters of this provision specifically noted their intent to

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[15] The *en banc* decision reversed a prior three-judge panel decision which, by a 2 to 1 vote, had invalidated the rule, in part on the grounds that the Administrator "must find that the lead from auto emissions by itself or alone contributes a measurable increment of lead to the human body, and that this measurable increment causes a significant health hazard." *Ethyl Corp. u. EPA*, No. 73-2205, slip op. at 8 (D.C. Cir. Jan. 28, 1975).

[16] The logic of *Ethyl Corp.* is directly relevant here because, as the court noted, the "threshold determination" of endangerment under section 211 is identical to the threshold endangerment determination under section 202. 541 F.2d at 16.

"support the views expressed" in *Ethyl Corp*. H.R. Rep. No. 95-294, at 49 (1977). In particular, the amendment was intended "to emphasize the predominant value of protection of public health," and "the Administrator's duty to assess risks rather than wait for proof of actual harm." *Id.* at 49, 51. The statutory changes reflected congressional "awareness of the uncertainties and limitations in the data which will be available to the Administrator in the foreseeable future to enable him to execute his rulemaking duties under this act." *Id.* at 50. Thus, section 202(a)(1) was rewritten explicitly to endorse the approach that Administrator Train followed in the lead additive rulemaking.[17]

The epilogue to the lead additive rulemaking story is both telling and heartening. As lead in gasoline declined between 1976 and 1980, a comprehensive study by the Centers for Disease Control ("CDC") showed that mean blood lead levels declined "in virtual lockstep" with this phase-down, leading the D.C. Circuit Court of Appeals to conclude in 1983 that "[g]asoline lead correlates strongly with blood lead levels." *Small Refiner Lead Phase-Down Task Force v. U.S.E.P.A.*, 705 F.2d 506, 527-28 (D.C. Cir. 1983) (including graph of the study results). Other studies showed that when leaded gasoline use peaked sharply each summer, blood lead levels peaked sharply in parallel, likewise confirming the correlation between the two. *Id.* at 528. Most gratifying, the percentage of very young children (six months to five years in age) with clinical lead poisoning also dropped precipitously during the four-year study period, highlighting the regulations' tangible effects

[17] The House Report on the bill noted that the same basic formula – "may reasonably be anticipated to endanger" – was deliberately written into several different sections of the statute, including sections 108, 111, 112, 202, 211, and 231. H.R. Rep. No. 95-294, at 50.

on the most vulnerable members of our society. *Id.* at 529. As one CDC official summarized, "as we have removed lead from gasoline, we have also removed lead from ourselves and our children." *Id.* at 527-28.

In fulfilling its statutory responsibilities to address preventively new threats as they arise, EPA also furthered the nation's scientific understanding of a public health crisis and its solutions. The epidemiological evidence that accumulated after the initial phase-down of lead additives prompted EPA to adopt a further phase-down, *see* 50 Fed. Reg. 9386 (Mar. 7, 1985), and ultimately spurred Congress to ban leaded gasoline altogether in the 1990 amendments to the Clean Air Act. 42 U.S.C. § 7545(n) (prohibiting the sale of leaded gasoline after December 31, 1995). As a result, ambient airborne lead concentrations in the United States declined by 97 percent between the beginning of the phase-down in 1976 and the full phase-out in 1995, *ATSDR Lead Profile* at 302, and over roughly the same period, mean blood lead levels across the nation dropped by almost 80 percent. *ATSDR Lead Profile* at 326.

B. The Listing Of Benzene As A Hazardous Air Pollutant.

This same preventive, science-based approach to regulatory decisionmaking was carried forward by the next EPA Administrator. Shortly after his appointment in 1977, Administrator Douglas Costle took the first, critical step in regulating environmental exposure to benzene by listing the chemical as a "hazardous air pollutant" under the Clean Air Act. The Administrator's decision was based exclusively on the emerging scientific evidence that benzene may be a human carcinogen, at least at higher exposure levels. Unsurprisingly, this action was opposed by industry. But the

listing decision set the stage for further study and analysis of both stationary and mobile sources of ambient benzene and was the first necessary step in the development of the benzene standards that exist today.

Benzene is a volatile organic compound used in the manufacture of such items as detergents, pesticides, solvents, and paint removers and also is a constituent of gasoline. It first came into significant industrial use as a solvent in the rubber industry just prior to World War I. 43 Fed. Reg. 5918 (Feb. 10, 1978). Greatly increased quantities of benzene were produced during the war, resulting in more widespread use of the compound in the decades that followed. *Id.* By the mid-1970's, annual U.S. production of benzene was 11 billion pounds and "rapidly expanding." *Id.*

The noncarcinogenic health effects of inhaled benzene, including a variety of blood disorders, have been recognized since 1900. *See* 43 Fed. Reg. 5920-25. Various other studies have linked benzene to chromosomal abnormalities and leukemia, a cancer of the white blood cells, since at least the 1930's. *Id.* at 5925-33. This Court summarized the state of scientific knowledge in the mid-1970's:

> As early as 1928, some health experts theorized that there might also be a connection between benzene in the workplace and leukemia. In the late 1960's and early 1970's a number of epidemiological studies were published indicating that workers exposed to high concentrations of benzene were subject to significantly increased risk of leukemia. In a 1974 report recommending a permanent standard for benzene, the National Institute for Occupational Safety and Health (NIOSH), OSHA's research arm, noted that these studies raised the "distinct possibility" that benzene caused leukemia. . . . NIOSH suggested that further studies were necessary to determine conclusively whether

> there was a link between benzene and leukemia and, if so, what exposure levels were dangerous.

Industrial Union Dep't, AFL-CIO v. American Petroleum Inst., 448 U.S. 607, 618 (1980) (citations omitted).

New studies published between 1974 and 1976 continued to suggest a possible causal link between leukemia and high (workplace) levels of benzene exposure. *Id.* In response to these studies, the Occupational Safety and Health Administration ("OSHA") established an emergency temporary workplace standard for benzene in 1977. 42 Fed. Reg. 22,516, 22,517 (May 3, 1977). In promulgating a permanent occupational exposure standard for benzene the following year, the Secretary of Labor recognized that, even with respect to acute workplace exposure, the health effects and epidemiological studies left some scientific questions unanswered. *See, e.g.*, 43 Fed. Reg. at 5929.

Nevertheless, EPA Administrator Costle stepped forward to protect the broader public's health under his Clean Air Act authority. Just over a month after issuance of OSHA's emergency occupational exposure standard, EPA formally listed benzene as a "hazardous air pollutant" under then-section 112(b)(1)(A) of the Act. 42 Fed. Reg. 29,332 (June 8, 1977). When this listing was made, the language of section 112 was similar to the language of section 202(a)(1), with the endangerment-type criteria for determining which pollutants to regulate embedded in the definition of a "hazardous air pollutant" as "an air pollutant to which no ambient air quality standard is applicable and which in the judgment of the Administrator may cause, or contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness." Pub. L. 91-604, § 4(a), 84 Stat. 1676, 1685 (1970).

Based on OSHA's scientific data and analysis, Administrator Costle determined that benzene met the health-based criteria of section 112, even though virtually all of the studies involved acute workplace exposure, not more diffuse ambient exposure. EPA acknowledged that "ambient air exposures are at levels substantially lower than those to which affected workers were exposed." 42 Fed. Reg. at 29,332. But noting that 260 million pounds of benzene were emitted to the air in the United States every year, the Administrator concluded that he had the authority to make an endangerment finding because "there is *reason to believe* that ambient exposures *may* constitute a cancer risk and should be reduced." *Id.* (emphasis added).

EPA plainly saw its decision to regulate as a two-step process. First, the Agency made its endangerment-type finding based on the best available science. The second and later step was the issuance of implementing regulations to control various benzene sources. *Id.* at 29,333 (inviting public comment and initiating a "careful evaluation" of available control technologies and associated risks). EPA was under no illusions that this second step would be easy, alluding in the listing decision to its past difficulties in developing control technologies for the previously listed hazardous air pollutant vinyl chloride. *Id.* That prescient concern,[18] however, did not impede the

[18] In 1981, after an evaluation of benzene risks, EPA proposed regulations for fugitive emission sources in the petroleum refining and chemical manufacturing industries. 46 Fed. Reg. 1165 (Jan. 5, 1981). Following protracted litigation over the hazardous air pollutant program, a final benzene emissions rule for storage units at coke by-product recovery plants was finally promulgated in 1989. 54 Fed. Reg. 38,044 (Sept. 14, 1989). Six months later, EPA issued final rules for benzene waste and benzene transfer operations. 55 Fed. Reg. 8292 (Mar. 7, 1990).

Administrator from meeting his statutory obligations to regulate benzene, even in the face of uncertainty about the health risks associated with environmental exposure.

EPA's public health-protective approach has proven far-sighted. In the 1990 Clean Air Act Amendments, Congress revised section 112 to designate a specific list of hazardous air pollutants, including benzene. 42 U.S.C. § 7412(b). At the same time, Congress provided EPA with new direction to study mobile source-related air toxics and to promulgate regulations to control hazardous air pollutants from motor vehicles. 42 U.S.C. § 7521(l)(1)-(2). Benzene has become one of the primary foci of this new program, in part due to its toxicity and in part because it makes up roughly 70 percent of gaseous toxics from these sources. *See* 65 Fed. Reg. 48,058, 48,077 (Aug. 4, 2000). Had Administrator Costle failed to fulfill his statutory responsibility to regulate benzene due to its potential health impacts, EPA could not have moved forward with its slow-but-steady progress in protecting the public from this carcinogen.

C. EPA's Acceleration Of The Phase-Out Of Certain Ozone-Depleting Substances.

Administrator William Reilly's aggressive action to accelerate the phase-out for certain ozone-depleting substances provides yet another example of how EPA has successfully fulfilled its Clean Air Act responsibility to address rapidly developing scientific data about a potential public health disaster. The story of the Administrator's action on ozone depletion is especially salient here because it illustrates how the Agency has utilized its public health mandate under the Clean Air Act to tackle a global pollution problem by providing international leadership.

Stratospheric ozone protects the biosphere from potentially damaging doses of ultraviolet ("UV") radiation, which can induce a variety of serious health effects, primarily to the skin, eyes and immune system. Skin effects include sunburn, aging of the skin and various forms of skin cancer including melanoma, the deadliest form of skin cancer that causes more than 7,000 deaths annually in the United States. UV radiation also causes cataracts and cancer of the cornea. Sunlight exposure reduces immunological defenses, impeding resistance to infectious diseases and skin tumors and diminishing the effectiveness of vaccines. In addition to its adverse health impacts, UV exposure can also damage ecological and agricultural systems by, for example, abetting the formation of photochemical smog, lowering the immunity of vegetation to pest infestation, and disrupting nutrient cycles and killing fish.[19]

In 1974, two scientists from the University of California published a paper in which they hypothesized that the ozone layer could be threatened with destruction from a family of chemicals known as chlorofluorocarbons ("CFCs"). These chemicals were used in numerous industrial applications including aerosol propellants, foam blowing, air conditioning and solvents, and were particularly attractive because they had been thought to pose insignificant environmental risks. In 1985, spurred by the 1974 paper, two British scientists studying springtime ozone levels in the stratosphere over Antarctica published startling new findings: Seasonal ozone loss had sharply accelerated to the point where a "hole" of significantly

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[19] *See generally* EPA, *Human Health Benefits of Stratospheric Ozone Protection* (April 2006), available at http://www.epa.gov/ozone/science (visited Aug. 29, 2006).

decreased ozone levels in the stratosphere had grown to cover an area the size of the United States. By 1987, the international community had negotiated the Montreal Protocol, which required all signatories to freeze and then reduce the production and consumption of a specific set of ozone-depleting substances.[20]

The ink had barely dried on the Montreal Protocol when significant new scientific analyses indicated that stratospheric ozone depletion was occurring at a more rapid rate than previously believed. Studies indicated significant stratospheric ozone decreases in winter, and, for the first time, also in spring and summer in both the northern and southern hemispheres. There also was concern that a springtime ozone "hole" might now appear in the Arctic. *See* 58 Fed. Reg. 15,014, 15,015-16 (Mar. 18, 1993).

Responding directly to this new information, former President George H.W. Bush, at the recommendation of EPA Administrator Reilly, announced in February 1992 that the United States would take action to phase out production of certain ozone-depleting substances on a more expedited basis than the Montreal Protocol then mandated.[21] EPA immediately began work on a rulemaking to implement this announcement. Significantly, this rulemaking was undertaken in part pursuant to certain

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[20] *See generally* Richard Elliot Benedick, *Ozone Diplomacy: New Directions in Safeguarding the Planet* (1998 ed.).

[21] Although the Montreal Protocol was revised in 1990 to require a phase-out of ozone-depleting substances by 2000 (or in some cases by 2005), President Bush announced that the United States would require a complete phase-out by January 1, 1996. Library of Congress, Congressional Research Service, *Stratospheric Ozone Depletion: Regulatory Issues* (Nov. 1996), available at http://www.ncseonline.org/nle/crsreports/stratospheric/strat-1.cfmm (visited Aug. 29, 2006).

provisions of the 1990 Clean Air Act Amendments, which directed EPA to promulgate a more aggressive schedule than otherwise required for phasing out the production and consumption of certain ozone-depleting substances if, "based on an assessment of credible current scientific information ... regarding harmful effects on the stratospheric ozone layer associated with [such substances], the Administrator determines that such more stringent schedule may be necessary to protect human health and the environment against such effects." 42 U.S.C. § 7671e(a)(1).

EPA's efforts to implement President Bush's announced schedule culminated in Administrator Reilly's signing of a proposed rule in January 1993,[22] and the Agency promulgated a final rule later that year. 58 Fed. Reg. 65,018 (Dec. 10, 1993). Moreover, in the interim, the Montreal Protocol signatories met again in the fall of 1992 and agreed to amend the international treaty to adopt the more aggressive phase-out schedules that had been announced by the United States. *See id.* at 65,020-21.

Here again, the Agency's authority (and responsibility) to take regulatory action based on newly emerging and credible scientific evidence, despite some remaining uncertainties, proved to be a critical tool in fulfilling its mission to protect human health and the environment. EPA utilized its broad protective authority under the Clean Air Act to lead the world in addressing an air pollution problem of global consequence when the statutory "endangerment" criterion was satisfied.

The postscript to EPA's proactive efforts on ozone-depleting substances is also instructive. Within the past

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[22] The proposal was published two months later. 58 Fed. Reg. 15,014 (Mar. 18, 1993).

several weeks, the World Meteorological Organization and the United Nations Environment Program have reported that the Earth's ozone layer is on the mend and, while recovering more slowly than experts had originally hoped, should be fully recovered within the next sixty years.[23]

D. The Establishment Of New National Ambient Air Quality Standards For Particulate Matter.

EPA's three-decade struggle to protect the public from the hazards of particulate air pollution, culminating in the development during Administrator Carol Browner's tenure of a national standard for the most dangerous fine particulate matter, provides one last example of the Agency's use of its Clean Air Act regulatory responsibility to respond to emerging scientific information, without specific direction from Congress, and to do so based exclusively on the available science.

The Clean Air Act Amendments of 1970 did not specifically list particulate matter[24] as a pollutant for which a national ambient air quality standard ("NAAQS") was required. Based on the scientific evidence available at that time, however, EPA used its general authority under section 109 of the Act, 42 U.S.C. § 7409, to establish a NAAQS for total suspended particles, which included particles as large as 45 micrometers. *See* 36 Fed. Reg. 8186 (Apr. 30, 1971). Subsequent advances in

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[23] *Ozone Layer Healing, But More Slowly Than Hoped*, Wash. Post, Aug. 19, 2006, at A03.

[24] Particulate matter ("PM") is a complex mixture of small particles and liquid droplets made up of a number of components, including acids (such as nitrates and sulfates), organic compounds, metals, soil, and dust particles. It originates from a variety of anthropogenic stationary and mobile sources, as well as from natural sources. *See* 62 Fed. Reg. 38,652, 38,653 (July 18, 1997).

scientific knowledge revealed that smaller particles were the most dangerous to human health because they have the greatest potential to enter the lungs, potentially causing serious heart and lung problems. Accordingly, in 1987, EPA responded again by establishing a new NAAQS for particulate matter sized 10 micrometers or smaller ("PM_{10}"). *See* 52 Fed. Reg. 24,634 (July 1, 1987).

Subsequent epidemiological studies suggested the existence of "serious health effects (mortality, exacerbation of chronic disease, increased hospital admissions, etc.) associated with exposures to ambient levels of PM found in contemporary U.S. urban airsheds even at concentrations *below*" the 10 micrometer size. 61 Fed. Reg. 65,638, 65,641 (Dec. 13, 1996) (emphasis added). In particular, the science indicated that very fine particles – those 2.5 micrometers in size or smaller ("$PM_{2.5}$") – were more likely to penetrate deeply into the lungs and contribute significantly to adverse health effects, including premature mortality; aggravation of respiratory and cardiovascular disease, changes in lung function and increased respiratory symptoms, changes to lung tissues and structure, and altered respiratory defense mechanisms. *Id.* Sensitive subpopulations, such as those with respiratory and cardiovascular disease, the elderly, children, and asthmatic individuals, are at greatest risk. *Id.* at 65,644.

Responding to the science, EPA proposed a new NAAQS for $PM_{2.5}$ 61 Fed. Reg. at 65,649 (explaining the emergence of new epidemiological data on the impacts to sensitive subpopulations). Further regulatory action was imperative based on:

> (1) Health effects information, and alternative views on the appropriate interpretation and use of the information, as the basis for judgments about the risks to public health presented by population exposures to ambient PM; (2) insights gained from

> a quantitative risk assessment conducted to provide a broader perspective for judgments about protecting public health from the risks associated with PM exposures; and (3) specific conclusions regarding the need for revisions to the current standards and the elements of PM standards (i.e., indicator, averaging time, form, and level) that, taken together, would be appropriate to protect public health with an adequate margin of safety.

Id. at 65,641.

At the same time, however, Administrator Browner explicitly acknowledged, in the preamble to the final rule, the existence of residual uncertainty about the causal connection between $PM_{2.5}$ in ambient air and adverse impacts to public health:

> As with virtually any policy-relevant scientific research, there is uncertainty in the characterization of health effects attributable to exposure to ambient PM. . . . While significant uncertainties exist, the review of the health effects information has been thorough and deliberate. In the judgment of the Administrator, this intensive evaluation of the scientific evidence has provided an adequate basis for regulatory decision making at this time.

62 Fed. Reg. 38,652, 38,655 (July 18, 1997).[25] Thus, EPA carried out its Clean Air Act responsibilities precisely as

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[25] For instance, scientists disagreed whether a new NAAQS was required to regulate all forms of $PM_{2.5}$ or whether EPA should delay the setting of the standard until more information about the types of particles that deserve regulation was known. In 1996, many of the studies recognized that $PM_{2.5}$ that is rich in either biologically active material or in various metals was likely to be more harmful than $PM_{2.5}$ which has little or no biologic or metallic content. *See, e.g.*, EPA, *Air Quality Criteria for Particulate Matter*, Vol. II, Ch. 8, p. 88 (March 2001). Nonetheless, EPA Administrator Browner chose to err on the side

(Continued on following page)

Congress intended, exercising its technical judgment to review the relevant science and making an endangerment determination based only on the science, even in the face of some residual uncertainty.

The Agency's consistent and exclusive reliance on science to establish the NAAQS for $PM_{2.5}$ was unanimously upheld in *Whitman v. American Trucking Ass'ns,* 531 U.S. 457, 469 (2001), where this Court rejected industry's contention that economic costs may be considered in making the determination as to which pollutants to regulate.[26]

The Clean Air Act did not identify $PM_{2.5}$ as a pollutant of concern. Instead, EPA scientists determined from the scientific literature that fine particles were likely endangering public health and welfare, and the Administrator responded using the tools provided by Congress under the Clean Air Act. As a result of EPA's actions, urban air quality has already improved significantly in just a few years,[27] and it is expected that the new $PM_{2.5}$ standards will save 15,000 lives each year.[28]

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of public health and regulate all forms of $PM_{2.5}$ rather than delay the setting of the standard until further information on the composition and toxicological effects of $PM_{2.5}$ became available. 62 Fed. Reg. at 38,665-67.

[26] It is worth noting that in the Agency's very first round of NAAQS rulemakings in 1971 for a variety of air pollutants, public commenters objected to the proposed NAAQS based on concerns relating to the "feasibility of implementing the proposed standards." In response to those objections, EPA stated that determining which pollutants to regulate "does not permit any factors other than health to be taken into account." 36 Fed. Reg. at 8186.

[27] EPA, *The Particulate Pollution Report: Current Understanding of Air Quality and Emissions Through 2003*, at 1 (Dec. 2004), available at http://www.epa.gov/airtrends/aqtrnd04/pm.html (visited on Aug. 29, 2006).

[28] *See* EPA, *Health and Environmental Effects of Particulate Matter* (July 17, 1997), available at http://www.epa.gov/ttn/oarpg/naaqsfin/pmhealth.html (visited on Aug. 29, 2006).

III. THE AGENCY'S DECISION NOT TO REGULATE VEHICLE EMISSIONS OF POLLUTANTS ASSOCIATED WITH CLIMATE CHANGE MISREADS THE CLEAN AIR ACT AND DEVIATES FROM PAST PRACTICE.

EPA's 2003 decision not to regulate vehicle emissions of pollutants that contribute to climate change represents a fundamental misunderstanding of its responsibilities under the Clean Air Act and a troubling rejection of the bedrock principles that have been so instrumental in the statute's successful implementation. In refusing to regulate vehicle emissions of those air pollutants, EPA construed its authority in a manner that is both too narrow and too broad.

On the one hand, EPA too narrowly construed its authority insofar as it believed that it could not act in the absence of a specific congressional directive. This construction of its authority turns the statute on its head and is at odds with EPA's past practice. As the above examples show, it is precisely those emerging threats with greatest potential to harm human health and welfare that EPA ought to regulate under the expansive authority provided in the Clean Air Act. Many of the Agency's and our nation's finest chapters have been written when it has kept faith with those fundamental principles.

On the other hand, EPA's construction of its authority was too broad in that it refused to regulate greenhouse gases because it "disagreed" with the Clean Air Act's regulatory scheme. *Amici* have never understood the exercise of the Administrator's judgment to be unbounded by the language of the law. As EPA successfully argued in this Court just five years ago, Congress has already made the policy judgment that public health considerations alone should drive the decision to regulate any particular

air pollutant. *Whitman v. American Trucking*, 531 U.S. at 465-72. The Agency's job is to apply this policy direction to specific instances; EPA does not have discretion to refuse to regulate based on factors that Congress has prohibited it from considering. *Id.* at 467. *See also Ethyl Corp. v. EPA*, 541 F.2d at 20 ("Sections 108 and 202 are mandatory in their terms; under both sections the Administrator 'shall' regulate if 'in his judgment' the pollutants warrant regulation. . . . By contrast, section 211 is permissive; the Administrator 'may' regulate if emissions 'will endanger the public health.'").[29]

The 2003 decision also misapprehends the historic and proper role of scientific uncertainty in EPA regulatory decisions under the Clean Air Act. As the *Ethyl Corp.* court recognized, and as Congress subsequently reiterated, scientific uncertainty is inherent in such decisions and, therefore, unavoidable. The 1977 Clean Air Act Amendments, which revised the language of section 202(a)(1) from "will endanger" to "may reasonably be anticipated to endanger," were expressly intended to acknowledge and accommodate "the limitations on research resources and the fact that decisionmaking about the risks to public health from air pollution falls on 'the frontiers of scientific and medical knowledge.'" H.R. Rep. No. 95-294, at 50.

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[29] That is not to say that other factors, such as economic impacts and technological feasibility, are entirely irrelevant. As the Court explained, Congress directed EPA to consider other factors at the implementation – as opposed to the threshold determination – stage. *Whitman v. American Trucking*, 531 U.S. at 467. This two-step approach is evident in section 202(a), as well. Under subsection 202(a)(1), the Administrator "shall" make the health-based endangerment determination. 42 U.S.C. § 7521(a)(1). Then, in implementing regulations under subsection 202(a)(2), EPA may consider such factors as requisite technology and costs of compliance. *Id.* § 7521(a)(2).

In its decision on the petition in this case, EPA relied upon the National Research Council's statement that "a casual linkage between the buildup of greenhouse gases in the atmosphere and the observed climate changes during the 20th century cannot be *unequivocally* established." 68 Fed. Reg. 52,922, 52,930 (Sept. 8, 2003) (emphasis added). In other words, EPA demanded unequivocal proof of a causal link between greenhouse gases and global climate change before an "endangerment" finding is made. "Such a rule would compel EPA to leave hazardous pollutants unregulated unless and until it completely understands every risk they pose, thus thwarting the Clean Air Act's requirement that the Agency err on the side of caution." *American Trucking Ass'ns, Inc. v. EPA*, 283 F.3d 355, 370 (D.C. Cir. 2002) (upholding $PM_{2.5}$ and ozone NAAQSs on remand from this Court). Indeed, had such a flawed approach been followed by EPA in the past, *Amici* would not have been able to protect the public health and the most vulnerable members of our society from the hazards of leaded gasoline, airborne benzene, ozone-depleting CFCs, and particulate matter.

For the past 35 years, our nation has been exceptionally well-served by the system of environmental protection laws put into place by Congress. We have led the world in securing a safe and healthy environment for our citizens, and for the generations to come. The sense of stability and well-being that these efforts have instilled, together with their accompanying economic benefits, have been enormous. While some may wish to stray from the Clean Air Act's successful path under the significant challenge posed by global climate change, the power to do so resides with Congress, not the Agency. Unless and until Congress elects to rewrite the Clean Air Act, EPA's proper role is to apply its technical expertise to the emerging science and, on that

basis alone, make an endangerment determination, one way or the other.

CONCLUSION

The decision of the D.C. Circuit should be reversed for the reasons explained above.

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